Bridge Boring Log No. BB-1

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 571 Feet
Location: N29°22' 55.35" W098°29' 40.35"
Logged By: RE / JLK
Sampling Date: 5-7-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CL) with sand & some gravel, dark brown, moist, hard		1:ST	13	17	46	29			60		
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard		2:SS	30					24			
	5	3:ST	31	25	88	63	5.00		99		
		4:ST	28				7.25			93	2.5
		5:ST	28	25	79	54	6.50				
	10 Feet										
		6:ST	28				4.50			95	5.3
	558										
Clay SHALE dark gray, dense to very dense	15	7:ST	30	26	84	58	4.50				
		8:ST	28				7.25			95	7.6
	20 Feet										
		9:ST	28				7.00				
	25										
		10:ST	24				10.25			103	12.1
	30 Feet										
		11:ST	23					50/6"			
	35										
		12:ST	23				10.50			103	13.2
	40 Feet										

(continued)

Grab Bag Sample (GB)
Shelby Tube Sample (ST)
Split Spoon Sample (SS)
Water encountered during drilling
Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Bridge Boring Log No. BB-1 Continued

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Logged By: RE / JLK
Sampling Date: 5-7-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clay SHALE dark gray, very dense	40										
	45	12:SS	21					50/6"			
	50 Feet	13:SS	23					**50/6"			
	55	14:SS	23					**50/6"			
		15:SS	24					**50/6"			
Completion Depth: 59 Feet	60 Feet										
	65										
	70 Feet										
	75										
	80 Feet										

Groundwater: Noted at 55 ft. during drilling
Final reading of 44 ft. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Bridge Boring Log No. BB-2

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 543 Feet
Location: N29°21' 45.75" W098°28' 11.25"
Logged By: RE / JLK
Sampling Date: 5-14-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand, dark brown, moist to very moist, hard to stiff		1:ST	15				4.50		76		
		2:ST	36	22	70	48	1.00				
- with gravel	5	3:ST	31				1.75		51		
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard		4:ST	32	24	72	48	3.00				
	533 10 Feet	5:ST	29				5.75		98		
		6:ST	28	25	76	51	5.50				
	528 15	7:ST	27				7.00				
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense		8:SS	24	25	77	52		50/6"			
	523 20 Feet										
	25	9:SS	25					50/6"			
	30 Feet	10:SS	25					50/5"			
	35	11:SS	24					50/4"			
		12:SS	25					**50/2"			
Completion Depth: 38 Feet 8 Inches	40 Feet										

Groundwater: Noted at 4.5 ft. during drilling.
Final reading of 2 ft. 8 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-1

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 603 Feet
Location: N29°24' 01.75" W098°29' 19.65"
Logged By: RE / JLK
Sampling Date: 5-2-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) with trace of gravel, dark gray brown, moist, medium dense		1:ST	17	19	46	27	3.50		33	101	
		2:ST	14				3.50				
GRAVEL(GP-GC) with some sand & clay, red brown, wet, medium dense	5										
	597	3:SS	19	16	47	31		16	10		
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard Pinhole Classification = ND3		4:SS	28					18			
	10 Feet	5:SS	25	20	64	44		34			
		6:SS	25					36			
	15	7:ST	24	20	65	45	6.00				
		8:ST	24				6.50			103	2.7
	20 Feet										
		9:ST	22				9.00				
	25										
		10:ST	22				8.00			108	5.1
Clay SHALE dark gray, dense	30 Feet										
		11:ST	22				8.75				
	35										
		12:ST	19				8.00			109	8.3
Completion Depth: 39 Feet	40 Feet										

Groundwater: Noted at 3.5 ft. during drilling.
Final reading of 2 ft. 6 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-2

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 615 Feet
Location: N29°23' 43.55" W098°29' 26.15"
Logged By: RE / JLK
Sampling Date: 5-13-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Fill: Clayey GRAVEL(GC) with sand, dark gray brown, slightly moist to moist, very dense to medium dense		1:ST	3				14.00		17		
		2:SS	9	19	42	23		25			
	5	3:ST	9								
Fill: Clayey SAND(SC) with some gravel, light gray brown, moist, dense		4:SS	15	19	41	22		40	18		
		5:ST	15				8.75				
	10 Feet										
Clayey SAND(SC) with some gravel, gray brown, moist, dense		6:SS	17	18	52	34		42	35		
	15	7:ST	11				4.00				
		8:ST	15	18	31	13			47		
	20 Feet										
	25	9:SS	18	17	32	15		16			
	30 Feet	10:SS	16					37			
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard	35	11:SS	29	20	59	39		32			
Completion Depth: 35 Feet	40 Feet										

Groundwater: Noted at 24.5 ft. during drilling
Final reading of 22 ft. 6 in. after 8 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-3

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 600 Feet
Location: N29°23' 39.45" W098°29' 38.9"
Logged By: RE / JLK
Sampling Date: 5-3-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey GRAVEL(GC) with sand, dark gray brown, moist, very dense		1:ST	8	24	58	34	14.00		29		
-clayey, gray brown, dense		2:SS	8	20	66	46		32			
	5										
- very moist, medium dense		3:SS	15					23	41		
		4:SS	18					50/6"			
		5:SS	6	17	36	19		50/6"			
-sandy	10 Feet										
		6:SS	5					50/6"	22		
CRETACEOUS MARINE DEPOSITS	15										
CLAY(CH) light gray brown, moist, hard		7:SS	28	19	61	42		24			
		8:ST	23				5.50			104	4.9
	20 Feet										
		9:ST	24	21	65	44	6.75				
	25										
		10:ST	23				6.00			104	3.5
	30 Feet										
		11:ST	25				6.50				
	35										
		12:ST	23				9.75			108	10.5
	40 Feet										
Completion Depth: 40 Feet											

Groundwater: Noted at 12.5 ft. during drilling
Final reading of 13 ft. 1 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-4

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 601 Feet
Location: N29°23' 31.55" W098°29' 41.75"
Logged By: RE / JLK
Sampling Date: 5-3-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey GRAVEL(GC) with sand, gray brown, moist, very dense		1:ST	8	16	34	18	14.00		32		
Sandy CLAY(CL) with trace of gravel, dark gray brown, moist, hard		2:SS	14					29			
	5		13								
Pinhole Classification = ND1		3:SS						25	56		
-some gravel, slightly moist		4:SS	5	16	39	23		50/6"			
	10 Feet	5:SS	11					43			
Clayey GRAVEL(GC) with sand, light gray brown, slightly moist to moist, dense to medium dense		6:SS	3					37	21		
	15										
		7:SS	6	17	36	19		22			
GRAVEL (GP-GC) with sand & trace clay, light gray brown, moist, medium dense	20 Feet	8:SS	12					17	9		
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, hard											
	25	9:SS	25					58			
		10:ST	26				6.00				
	30 Feet										
		11:ST	27				6.50			99	4.7
	35										
		12:ST	25				6.75			98	7.0
	40 Feet										
Completion Depth: 40 Feet											

Groundwater: Noted at 18 ft. during drilling. Final reading of 10 ft. 9 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-5

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 601 Feet
Location: N29°23' 30.6" W098°29' 44.85"
Logged By: RE / JLK
Sampling Date: 5-3-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CL) with sand, dark brown, moist to slightly moist, very hard to hard		1:ST	13	16	36	20	14.00		78		
		2:ST	16				8.25				
-sandy, brown	5	3:ST	13	15	32	17	14.00		65		
		4:ST	7				14.00				
GRAVEL(GP) with trace of sand & clay, light gray brown, slightly moist, dense to very dense	10 Feet	5:SS	2	19	37	18		45	4		
		6:SS	4					**50/6"			
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, hard	15	7:SS	28	21	76	55		22			
		8:ST	30				4.25				
	20 Feet										
		9:ST	26	20	72	52	6.00			99	3.0
	25										
		10:ST	25				6.75				
	30 Feet										
		11:ST	29				6.00			92	4.9
	35										
		12:ST	36				5.00				
	40 Feet										
Completion Depth: 40 Feet											

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-6

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 577 Feet
Location: N29°23' 24.2" W098°29' 52.5"
Logged By: RE / JLK
Sampling Date: 5-6-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) with trace of gravel, dark brown, moist, very dense		1:ST	11	15	36	21	14.00		42		
		2:ST	8				14.00				
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard	5	3:ST	34	25	75	50	2.75				
		4:ST	33				2.50				
	10 Feet	5:ST	32	25	72	47	4.00				
		6:ST	34				6.00				
	15	7:ST	33				6.00			90	4.6
		8:ST	31				6.00				
	20 Feet										
	25	9:ST	16				4.00			102	2.4
Clay SHALE dark gray, dense to very dense		10:ST	27				8.00				
	30 Feet										
		11:ST	27				7.00				
	35										
		12:SS	13					**50/1"			
Completion Depth: 38 Feet 7 Inches	40 Feet										

Groundwater: Not noted during drilling.
Final reading of 33 ft. 3 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-7

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 573 Feet
Location: N29°23' 04.4" W098°29' 52.65"
Logged By: RE / JLK
Sampling Date: 5-6-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & some gravel, dark brown, moist, hard		1:ST	16						59		
		2:SS	17	20	74	54		26			
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, hard to very stiff	5	3:SS	25	21	78	57		30			
		4:ST	26				5.50				
		5:ST	28				4.50			92	4.1
	10 Feet	6:ST	28	23	78	55	5.75				
	15	7:ST	30				2.75			93	2.2
		8:ST	34				4.50				
	20 Feet										
		9:ST	36				3.00				
	25										
Clay SHALE dark gray, dense to very dense		10:ST	31				5.00				
	30 Feet										
		11:ST	39				4.00			82	5.9
	35										
		12:SS	26					50/4"			
	40 Feet										
Completion Depth: 39 Feet 4 Inches											

Groundwater: Not noted during drilling.
Final reading of 37 ft. 2 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-8

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 564 Feet
Location: N29°22' 47.3" W098°29' 20.1"
Logged By: RE / JLK
Sampling Date: 5-9-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & gravel, gray brown, moist, very stiff		1:SS	19	21	80	59		18	59		
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard		2:ST	26				9.75				
	5	3:ST	24	23	79	56	14.00			100	6.9
		4:ST	24				7.50				
		5:ST	27				9.50			97	2.8
	10 Feet	6:ST	29	25	83	58	6.25				
	15	7:ST	31				5.75			91	2.1
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		8:ST	26				14.00				
	20 Feet										
	25	9:ST	25				9.25			98	6.6
		10:ST	25				10.00				
	30 Feet										
		11:ST	24				10.50			100	9.9
	35										
		12:SS	25					50/6"			
	39 Feet										
Completion Depth: 39 Feet 6 Inches											

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-9

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 555 Feet
Location: N29°22' 32.55" W098°28' 47.7"
Logged By: RE / JLK
Sampling Date: 5-9-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey GRAVEL(GC) with trace to some sand, dark gray brown, moist to wet, medium dense -gray brown		1:SS	11	21	60	39		21	40		
		2:ST	26	24	73	49	2.00		37		
	551										
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	550	3:ST	32	25	85	60	5.50				
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		4:ST	27				5.00				
		5:ST	27	26	69	43	7.00				
	10 Feet										
BOC	544	6:ST	27				7.25			97	7.2
	15	7:ST	28	27	72	45	5.00				
		8:ST	25				7.75			98	6.7
	20 Feet										
		9:ST	26				7.00				
	25										
		10:ST	26				7.75			91	5.1
	30 Feet										
		11:ST	26				8.00				
	35										
		12:SS	26					85/10"		96	7.3
	40 Feet										

Completion Depth: 39 feet 10 inches

Groundwater: Noted at 3 ft. during drilling.
Final reading of 1 ft.after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-10

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 553 Feet
Location: N29°22' 21.85" W098°28' 37.95"
Logged By: RE / JLK
Sampling Date: 5-9-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) with some gravel, gray brown, moist, dense		1:SS	10	17	41	24		31	31		
	551	2:ST	32				4.00				
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	5	3:ST	32	27	90	63	6.25				
		4:ST	33				5.25			87	2.0
	543 10 Feet	5:ST	34	27	85	58	5.25				
	541.5	6:ST	32				4.50			88	2.7
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense	15	7:ST	29	27	84	57	7.75				
	20 Feet	8:ST	28				7.50			94	4.3
	25	9:ST	25				5.50				
	30 Feet	10:ST	25				10.50			101	11.7
	35	11:ST	36				9.00				
		12:SS	23					50/5"		110	14.6
	40 Feet										
Completion Depth: 39 feet 5 inches											

Groundwater: Not noted during drilling.
Final reading of 9 ft. 5 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-11

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 547 Feet
Location: N29°22' 03.1" W098°28' 22.35"
Logged By: RE / JLK
Sampling Date: 5-10-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey GRAVEL(GC) with some sand, dark gray brown, moist to very moist, dense		1:SS	12	18	47	29		30	49		
		2:ST	18				4.50				
	543										
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	5	3:ST	31	24	91	67	4.25				
		4:ST	31				5.00				
		5:ST	30				5.00			90	2.6
BOC	10 Feet										
		6:ST	29	23	85	62	5.50				
	15	7:ST	28				6.25			93	4.4
	527 20 Feet	8:ST	27	25	93	68	6.00				
	525										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		9:ST	26				8.00				
	25										
		10:ST	26				9.50				
	30 Feet										
		11:ST	26				4.75			99	5.8
	35										
	40 Feet	12:SS	26					86/10"			

Completion Depth: 39 Feet 10 Inches

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-12

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 539 Feet
Location: N29°21' 20.25" W098°28' 04.25"
Logged By: RE / JLK
Sampling Date: 5-14-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Fill: CLAY(CH) with sand & gravel, gray brown, moist, hard -has some asphalt material		1:ST	15	22	59	37	7.75		53		
		2:ST	17				6.00				
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard Pinhole Classification = ND1	5	3:ST	33				2.50				
		4:ST	32	23	83	60	4.50		98		
		5:ST	30				8.00			93	4.2
	10 Feet	6:ST	33				4.75				
	15	7:ST	30	26	88	62	6.00			93	3.7
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		8:ST	26				7.00				
	20 Feet										
	25	9:ST	26	25	71	46	8.50			99	9.5
	30 Feet	10:SS	27					45			
		11:SS	26					50/5"			
	35										
	40 Feet	12:SS	25					73			
Completion Depth: 40 Feet											

Groundwater: Not noted during drilling.
Final reading of 8 ft. 11 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-13

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 537 Feet
Location: N29°20' 55.75" W098°28' 01.35"
Logged By: RE / JLK
Sampling Date: 5-14-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) with some gravel, dark gray brown, slightly moist, medium dense		1:ST	7	21	48	27			36		
Clayey GRAVEL(GC) with sand, light gray brown, wet, loose		2:SS	26					5	40		
Clayey GRAVEL(GC) with sand, dark gray brown, moist, medium dense	5	3:SS	15					20	15		
Clayey GRAVEL(GC) with sand, light gray brown, wet, medium dense 530		4:SS	36	21	58	37		13	35		
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard	10 Feet	5:SS	31					24			
		6:SS	30	21	72	51		21			
	15	7:SS	29					24			
	20 Feet	8:SS	30	22	69	47		38			
	25	9:SS	27					48		98	8.2
	30 Feet	10:SS	23	21	72	51		52			
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense		11:SS	25					50/6"		99	13.4
	35	12:SS	24					50/6"			
	40 Feet										
Completion Depth: 39 Feet 6 Inches											

Groundwater: Noted at 3.5 ft. during drilling.
Final reading of 2 ft. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-14

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 523 Feet
Location: N29°20' 47.05" W098°27' 47.9"
Logged By: RE / JLK
Sampling Date: 5-13-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) with gravel, dark brown, moist, dense to very dense		1:SS	18					31	37		
		2:SS	22	19	48	29		50/2"			
	5	3:SS	19					**50/6"			
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		4:SS	12	17	44	27		57			
		5:SS	17					**50/3"			
	10 Feet	6:SS	21					**50/6"			
	15	7:SS	28	18	34	16		50/6"			
		8:SS						**10/0"			
	20 Feet	8:GB	22								
		9:SS						**50/1"			
	25	9:GB	20								
		10:SS	27					50/5"			
	30 Feet										
		11:SS						**10/0"			
	35	11:GB	20								
		12:SS	21					50/6"			
	40 Feet										
Completion Depth: 39 Feet 6 Inches											

Groundwater: Noted at 11 ft. during drilling.
Final reading of 4 ft. 11 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-15

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 515 Feet
Location: N29°20' 08.45" W098°27' 25.0"
Logged By: RE / JLK
Sampling Date: 5-15-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CL) with some sand & trace of gravel, dark brown, slightly moist to moist, hard to very stiff		1:SS	9	18	43	25		32			
		2:ST	23				6.00		79		
	5	3:ST	21				2.00				
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		4:ST	20	18	53	35	10.25				
		5:ST	20				10.75			106	10.5
	10 Feet	6:ST	20	19	54	35	9.25				
	15	7:ST	19				9.75			106	7.1
		8:ST	21				9.00				
	20 Feet										
		9:ST	20				10.00			108	11.5
	25										
	30 Feet	10:SS	20					85/10"			
Completion Depth: 29 Feet 10 Inches											
	35										
	40 Feet										

Groundwater: Not noted during drilling.
Final reading of 5 ft. 10 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

Weir Boring Log No. WB-16

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 499 Feet
Location: N29°19' 09.45" W098°26' 55.95"
Logged By: RE / JLK
Sampling Date: 5-17-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & gravel, dark brown, slightly moist, very hard		1:ST	10	19	50	31	14.00		50		
		2:ST	25				5.75				
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	5	3:ST	25				9.25			99	4.5
		4:ST	25	24	91	67	10.25				
		5:SS	27					38			
	10 Feet										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		6:ST	28				6.00			96	4.8
	15	7:ST	27				7.75				
		8:ST	25				8.00			98	8.7
	20 Feet										
		9:ST	24				14.00				
	25										
		10:ST	23				14.00			106	16.2
Completion Depth: 29 Feet	30 Feet										
	35										
	40 Feet										

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-1

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 614 Feet
Location: N29°24' 04.55" W098°29' 15.55"
Logged By: CB / JLK
Sampling Date: 5-2-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Sandy CLAY(CL) with some gravel, dark brown, moist, very hard		1:ST	11				14.00				
		2:ST	14	17	39	22	14.00		58	105	
	5	3:ST	18				6.50				
Clayey SAND(SC) gray brown, moist, very dense			16	17	38	21	10.50		25		
		4:ST	11				11.25				
Clayey SAND(SC) with gravel, light gray brown, moist to slightly moist, very dense	10 Feet	5:SS	5					47	16		
GRAVEL(GP-GC) with sand & trace clay, light gray brown, moist, very dense	12	6:SS	8					55	8		
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard Crumb Test = Grade 1	600 15	7:SS	30	19	59	40		15			
	20 Feet	8:SS	24					44			
		9:ST	23				7.00			107	7.4
	25										
		10:ST	25				8.00				
	30 Feet										
		11:ST	24				8.00			105	8.9
	35										
Clay SHALE dark gray, very dense		12:ST	22				10.75				
	40 Feet										
Completion Depth: 39 Feet 6 Inches											

Groundwater: Noted at 11 ft. during drilling. Final reading of 10 ft. 6 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-2

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 601 Feet
Location: N29°23' 39.05" W098°29' 37.35"
Logged By: RE / JLK
Sampling Date: 5-2-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey GRAVEL(GC) with sand, dark gray brown, slightly moist to moist, very dense to dense		1:ST	8	16	39	23	14.00		44		
		2:SS	7					56			
	5	3:ST	8				14.00				
		4:SS	14	17	45	28		42			
	10 Feet	5:SS	17					19	39		
		6:SS	15					43			
Clayey GRAVEL(GC) with sand, light gray brown, slightly moist, medium dense	15	7:SS	7	16	29	13		21	15		
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard	20 Feet	8:SS	23					17			
		9:ST	23				7.50				
	25										
	30 Feet	10:ST	24				10.25			107	7.9
		11:ST	23				10.00				
	35										
	40 Feet	12:ST	22				7.50			108	11.6
Completion Depth: 40 Feet											

Groundwater: Noted at 13 ft. during drilling. Final reading of 14 ft. 9 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-3

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 602 Feet
Location: N29°23' 23.6" W098°29' 51.95"
Logged By: RE / JLK
Sampling Date: 5-6-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Gravelly CLAY(CL) with sand, gray brown, moist, hard		1:SS	6					50/2"			
Clayey SAND(SC) with gravel, gray brown, moist, dense to medium dense Crumb Test = Grade 1		2:SS	3	13	37	24		47			
	5	3:SS	6					25	36	100	
		4:SS	8	14	44	30		33			
CLAY(CL) with sand & trace of gravel, dark brown, moist, very stiff	10 Feet	5:SS	15	16	45	29		19	75		
Clayey GRAVEL(GC) with sand, light gray brown, slightly moist, medium dense		6:SS	5					23	10		
	15	7:SS	8	18	41	23		24			
582	20 Feet	8:SS	39					18			
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, very moist, very stiff to hard		9:ST	36	26	79	53	2.50				
	25										
	30 Feet	10:ST	35				4.25			94	1.1
570											
	35	11:ST	33				5.25				
	40 Feet	12:ST	30				6.00			94	5.8
Completion Depth: 40 Feet											

Groundwater: Noted at 39 ft. during drilling. Final reading of 34 ft. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-4

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 588 Feet
Location: N29°22' 54.55" W098°29' 41.2"
Logged By: RE / JLK
Sampling Date: 5-7-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & trace of gravel, dark brown, moist, very hard to hard		1:ST	16				14+		74		
		2:SS	20	21	64	43		26			
	5	3:SS	23					18			
CLAY(CL) with sand & trace of gravel, dark brown, moist, very stiff to hard Crumb Test = Grade 3		4:ST	20				3.75		73		
		5:ST	20				4.00				
	10 Feet	6:ST	15	17	43	26	5.00				
-with trace of sand	15	7:SS	22					38	93		
	571										
CRETACEOUS MARINE DEPOSITS CLAY(CH) light gray brown, moist, hard		8:ST	27	24	86	62	8.25			97	6.0
	20 Feet										
		9:ST	27				8.50				
	25										
		10:ST	20				7.75			101	4.3
	30 Feet										
	557										
Clay SHALE dark gray, dense	555										
		11:ST	27	24	76	52	7.00				
	35										
		12:ST	27				8.25			96	1.7
	40 Feet										
Completion Depth: 40 Feet											

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-5

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 557 Feet Above Sea Level
Location: N29°22' 37.3" W098°29' 04.95"
Logged By: RE / JLK
Sampling Date: 5-7-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & trace of gravel, dark brown, moist, very hard to hard - slightly moist		1:ST	22	20	58	38	9.25		83		
		2:SS	10					**50/6"			
	5	3:SS	16					20			
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, very stiff to hard Crumb Test = Grade 1		4:SS	33	26	86	60		23			
		5:ST	32				3.75			89	1.5
	10 Feet	6:ST	31				7.00				
	15	7:ST	30	24	76	52	7.00			91	2.9
		8:ST	28				9.00				
	20 Feet										
	25	9:ST	28				8.75			97	3.7
	530										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense to dense		10:ST	24				12.00				
	30 Feet										
	35	11:ST	23	25	67	42	9.50			102	15.3
		12:ST	23				6.00				
	40 Feet										
Completion Depth: 40 Feet											

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-6

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 580 Feet Above Sea Level
Location: N29°22' 36.4" W098°29' 05.3"
Logged By: RE / JLK
Sampling Date: 5-7-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & trace of gravel, dark brown, moist to slightly moist, hard to very hard		1:ST	12	19	59	40	9.00				
		2:ST	17				13.50		77		
	5	3:SS	10					47			
Sandy CLAY(CL) with trace of gravel, dark gray brown, moist, hard Crumb Test = Grade 2		4:ST	20	15	45	30	4.25				
		5:ST	19				4.75		56		
	10 Feet										
CLAY(CL) with sand & trace of gravel, dark brown, moist, very stiff		6:ST	23	17	43	26	3.50				
	15	7:ST	26				2.25				
GRAVEL(GP-GC) with sand & trace of clay, light gray brown, moist, medium dense	20 Feet	8:SS	11					29			
	25	9:SS	15					18	9		
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	30 Feet	10:ST	32	28	79	51	4.50			89	2.6
	35	11:ST	32				7.50				
	40 Feet	12:ST	27				8.00			98	9.4
Completion Depth: 40 Feet											

Groundwater: Noted at 23 ft. during drilling. Final reading of 23 ft. 7 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-7

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 569 Feet
Location: N29°22' 20.85" W098°29' 38.8"
Logged By: RE / JLK
Sampling Date: 5-9-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Sandy CLAY(CL) dark gray brown, slightly moist to moist, very hard to hard Crumb Test = Grade 1		1:ST	9				14.00		64		
		2:ST	7	18	37	19	14.00				
	5	3:SS	12					27			
		4:ST	11	17	38	21	9.25				
Clayey SAND(SC) with trace of gravel, light gray brown, moist, loose to medium dense	10 Feet	5:SS	11					8	27		
		6:SS	18	18	33	15		12			
Clayey GRAVEL(GC) with sand, gray brown, very moist, medium dense	15	7:ST	20	18	47	29			24		
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard to very stiff	20 Feet	8:ST	32	27	88	61	6.75			90	3.4
		9:ST	34				4.00				
	5425 543										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense	30 Feet	10:ST	35				6.00			85	4.1
		11:ST	28				7.75				
	35										
		12:ST	25				9.00			98	8.3
	40 Feet										
Completion Depth: 40 Feet											

Groundwater: Not noted during drilling.
Final reading of 18 ft. 7 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-8

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 544 Feet
Location: N29°21' 53.45" W098°28' 17.45"
Logged By: RE / JLK
Sampling Date: 5-10-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) with some gravel, dark gray brown, moist, medium dense Crumb Test = Grade 2		1:SS	10	17	45	28		17	41		
		2:ST	32				5.50				
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	5	3:ST	27	24	79	55	4.50				
		4:ST	29				6.00				
	534 10 Feet	5:ST	28	24	84	60	5.25				
		6:ST	28				5.75			95	2.7
	539										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense	15	7:ST	27	24	83	59	7.00				
		8:ST	26				8.25			98	5.8
	20 Feet										
		9:ST	24				11.00				
	25										
		10:ST	25				11.75			100	11.3
	30 Feet										
		11:ST	24				6.25				
	35										
		12:SS	23					50/6"			
	40 Feet										

Completion Depth: 39 Feet 6 Inches

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-9

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 563 Feet
Location: N29° 21' 53.9" W098°28' 16.45"
Logged By: RE / JLK
Sampling Date: 5-10-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CL) with some sand & trace of gravel, dark brown, moist, very stiff Crumb Test = Grade 1		1:SS	11	18	48	30		16	80		
		2:SS	14					13			
CLAY(CH) with trace of sand, dark brown, moist, very hard to hard	5	3:ST	18	20	54	34	14.00		97		
		4:ST	16				14.00				
	553 10 Feet	5:ST	18	17	59	42	8.50				
		6:ST	15				14.00			106	5.4
GRAVEL(GP) with trace of sand & clay, light gray brown, moist to slightly moist, medium dense	15	7:SS	7	20	38	18		22	2		
	543		4								
TERTIARY (EOCENE) DEPOSITS CLAY(CH) gray brown, moist, very stiff to hard	20 Feet	8:SS	25					21			
		9:ST	27				6.25			96	4.4
-light gray brown	25										
	536										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense	533 30 Feet	10:ST	27				6.25			96	4.0
		11:ST	27				8.50				
	35										
	40 Feet	12:ST	26				9.75			99	5.6
Completion Depth: 40 Feet											

Groundwater: Noted at 18.5 ft. during drilling
Final reading of 33 ft. 9 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-10

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 537 Feet
Location: N29° 21' 13.3" W098°28' 03.45"
Logged By: RE / JLK
Sampling Date: 5-10-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Fill: Clayey SAND(SC) with gravel, dark gray brown, moist, loose Crumb Test = Grade 2		1:GB									
		2:SS	14					10	31		
CLAY(CH) with trace of sand, light gray brown, moist, stiff	5	3:ST	32	18	57	39	1.00		93		
GRAVEL(GP-GC) with some clay, light gray brown, wet to moist, dense to medium dense		4:SS	19					30	11		
	10 Feet	5:SS	11	21	51	30		20			
		6:SS	12					**50/6"			
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense	15	7:ST	31	21	68	47	1.50				
		8:ST	27				6.00				
	20 Feet										
		9:ST	27				8.00			99	9.8
	25										
	30 Feet	10:SS	26					80			
	35	11:SS	26					89/10"			
		12:SS	26					50/6"			
	40 Feet										

Completion Depth: 39 Feet 6 Inches

Groundwater: Noted at 6.5 ft. during drilling.
Final reading of 5 ft. 5 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-11

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 550 Feet
Location: N29° 21' 13.6" W098°28' 02.8"
Logged By: RE / JLK
Sampling Date: 5-10-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & trace to some gravel, moist, dark brown, hard to very hard Crumb Test = Grade 1		1:SS	14					29			
		2:ST	14	18	50	32	14.00		70		
Sandy CLAY(CL) with trace of gravel, light gray brown, slightly moist, very hard	5	3:ST	9	17	33	16	11.75		57		
CLAY(CH-CL) with some sand, dark brown, moist, hard to very stiff		4:ST	14				9.50				
	540 10 Feet	5:ST	18	17	53	36	9.00			103	9.9
		6:ST	19				8.00				
	15	7:ST	24	17	46	29	2.00		81	90	0.7
Clayey GRAVEL(GC) with sand, light gray brown, moist, medium dense	530 20 Feet	8:SS	12					21	16		
GRAVEL(GP-GC) with trace clay, light gray brown, slighlty moist, medium dense	25	9:SS	2					21	5		
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	523 520 30 Feet	10:SS	23					41			
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense	518 35	11:SS	27					53			
		12:SS	26					50/6"			
	40 Feet										
Completion Depth: 39 Feet 6 Inches											

Groundwater: Noted at 16 ft. during drilling. Final reading of 16 ft. 6 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-12

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 524 Feet
Location: N29°20' 43.55" W098°27' 41.4"
Logged By: RE / JLK
Sampling Date: 5-17-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) with trace of gravel, brown, moist, loose		1:ST	9						22		
			11				5.25				
Sandy CLAY(CH) brown, moist, hard to very stiff		2:ST	19	18	53	35	4.25		53		
Crumb Test = Grade 1	5	3:ST	14				2.50				
	518										
TERTIARY (EOCENE) DEPOSITS CLAY(CH) with trace of sand & gravel, light gray brown, moist, very stiff to hard		4:ST	25				2.00				
		5:ST	27	23	81	58	6.00				
	10 Feet										
		6:ST	24				8.00			101	2.2
-cemented iron oxide seam from 14 to 15 ft	15	7:SS						**10/0"			
		7:GB	22	21	68	47					
		8:ST	25				9.50			102	4.5
	20 Feet										
	502										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense		9:ST	26				14.00			99	8.2
	25										
		10:ST	25				12.00				
	30 Feet										
		11:ST	24				14.00			103	9.1
	35										
		12:SS	24					88/9"			
	40 Feet										
Completion Depth: 39 Feet 9 Inches											

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-13

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 543 Feet
Location: N29°20' 44.25" W098°27' 41.25"
Logged By: RE / JLK
Sampling Date: 5-14-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CL) with some sand & gravel, dark gray brown, moist, very hard Crumb Test = Grade 1		1:ST	11				14.00		65		
		2:ST	12	17	48	31	14.00				
Clayey SAND(SC) with some gravel, light brown, moist, dense to very dense - very moist	5	3:SS	9					31	43		
		4:SS	20	17	41	24		72			
	533 10 Feet	5:SS	12					55			
		6:SS	11	16	37	21		55			
	528 15	7:SS	13					**50/3"			
	525										
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, very hard	20 Feet	8:SS	23	23	86	63		52		104	9.5
	25	9:SS	23					58			
	518 30 Feet	10:SS	24					56			
	513 35	11:SS	22					51		101	4.4
	506										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense	40 Feet	12:SS	24					59		105	15.5
Completion Depth: 40 Feet											

Groundwater: Not noted during drilling or after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-14

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 531 Feet
Location: N29°20' 08.55" W098°27' 23.65"
Logged By: RE / JLK
Sampling Date: 5-15-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with gravel & some sand, dark brown, moist, hard Crumb Test = Grade 1		1:ST	16				6.75				
		2:ST	20	19	53	34	4.75		58		
	5	3:ST	15				4.00				
CLAY(CL-CH) with sand & trace of gravel, light gray brown, moist, hard		4:ST	10	17	48	31	8.00		69		
	521	5:ST	14				4.50				
-gray brown	10 Feet										
		6:ST	17	18	51	33	4.00				
	517										
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, very stiff to very hard	15	7:ST	26	20	58	38	3.25				
		8:ST	21				5.25				
	511 20 Feet										
		9:ST	22	20	62	42	7.00				
	506 25										
		10:ST	20				13.00			109	13.8
	501 30 Feet										
	497										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense		11:SS						**50/1"			
	495	11:GB	10								
		12:SS	19					50/6"			
	40 Feet										
Completion Depth: 39 Feet 6 Inches											

Groundwater: Not noted during drilling.
Final reading of 36 ft. 7 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-15

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 502 Feet
Location: N29° 19' 29.55" W098° 27' 13.9"
Logged By: RE / JLK
Sampling Date: 5-17-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
Clayey SAND(SC) dark gray brown, moist to slightly moist, dense to very dense Crumb Test = Grade 1		1:ST	19	19	47	28	5.50				
		2:ST	11				14.00		41		
	5	3:ST	4				11.75				
Clayey GRAVEL(GC) with sand, gray brown, moist to wet, dense to medium dense BOC		4:SS	7	17	39	22		54	12		
-light gray brown	10 Feet	5:SS	9					12			
		6:SS	31					20			
- moist	15	7:SS	17					28			
	20 Feet 482	8:SS	8					29			
	480										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, very dense		9:SS	25					50/6"		101	5.5
	25										
		10:SS						**10/0"			
	30 Feet	10:GB	28								
		11:SS	25					50/6"		94	6.1
	35										
		12:SS	24					50/6"			
	40 Feet										
Completion Depth: 39 Feet 6 Inches											

Groundwater: Noted at 7 ft. during drilling.
Final reading of 9 ft. 3 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-16

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 520 Feet
Location: N29° 19' 04.55" W098° 26' 49.65"
Logged By: RE / JLK
Sampling Date: 5-15-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CL) with some sand & trace to some gravel, dark brown, moist, very hard to firm Crumb Test = Grade 1		1:ST	11	18	46	28			67		
		2:ST	13				14.00				
	5	3:ST	13	14	31	17	7.00		81		
-light brown		4:ST	19	17	33	16	2.50		90		
		5:ST	19				4.00				
	10 Feet										
-wet		6:ST	29	18	37	19	1.00		90		
	15										
	504	7:SS	28					7			
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard	20 Feet	8:SS	35					28	94		
	497										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense	25	9:SS	29					39			
BOC	491										
	30 Feet	10:SS	30					40			
		11:ST	27				5.75			98	3.4
	35										
	40 Feet	12:SS	29					44			
Completion Depth: 40 Feet											

Groundwater: Noted at 12.5 ft. during drilling
Final reading of 9 ft. 5 in. after 24 hr. wait.

- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

River Boring Log No. RB-17

Address: San Antonio River
San Antonio, Texas
Location: See Boring Location Plan

Project: Mission Reach Portion of San Antonio River Expansion
Elevation: 496 Feet
Location: N29° 19' 05.9" W098°26' 48.3"
Logged By: RE / JLK
Sampling Date: 5-15-02

Soil Description	Depth	SN	WC	PL	LL	PI	PP	N	-200	DD	Uc
CLAY(CH) with sand & trace of gravel, dark brown, moist, hard to very stiff		1:ST	18	18	52	34	10.50		69		
		2:ST	27				3.50				
	492										
TERTIARY (EOCENE) DEPOSITS CLAY(CH) light gray brown, moist, hard BOC	491.5	3:ST	30	25	75	50	5.75				
		4:ST	30				5.25			91	2.4
		5:ST	31				5.00				
	10 Feet										
		6:ST	29	26	87	61	5.00				
	15	7:ST	27				6.50			97	3.0
	479										
CRETACEOUS MARINE DEPOSITS Clay SHALE dark gray, dense to very dense		8:ST	26	24	81	57	8.00				
	20 Feet										
		9:ST	26				8.75			95	6.0
	25										
		10:ST	24				8.00				
	30 Feet										
		11:ST	23				9.00			98	7.7
	35										
	40 Feet	12:SS	23					83/11"			
Completion Depth: 39 Feet 11 Inches											

Groundwater: Not noted during drilling.
Final reading of 31 ft. 10 in. after 24 hr. wait.

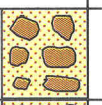
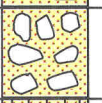
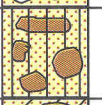
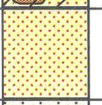
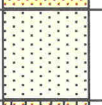
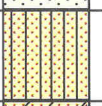
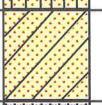
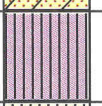
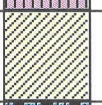
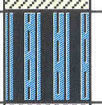
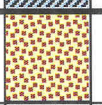
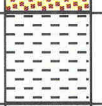
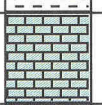
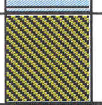
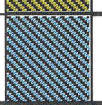
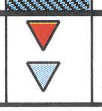
- Grab Bag Sample (GB)
- Shelby Tube Sample (ST)
- Split Spoon Sample (SS)
- Water encountered during drilling
- Quassi-static/24 hr. reading elevation

File No.: 01 SA-2295

Refer to Appendix for Additional Information

SN=Sample No. and Type
ST=Shelby Tube Sample
WC=Water Content, %
LL=Liquid Limit, %
NP=Non-Plastic
PP=Pocket Penetrometer, tsf
-200=% Pass # 200 Sieve
DD=Dry Density, pcf
SS=Split Spoon Sample
GB=Grab Bag Sample
PL=Plastic Limit, %
PI=Plasticity Index
N=SPT Blow Counts
**=Blow Counts During Seating Penetration
Uc=Unconfined Compression Test, tsf

KEY TO CLASSIFICATION SYMBOLS USED ON BORING LOGS

MAJOR DIVISIONS			GROUP SYMBOLS		DESCRIPTIONS
COARSE-GRAINED SOILS: More Than Half of Material LARGER Than No. 200 Sieve size	GRAVELS: More Than Half of Coarse Faction is LARGER Than No. 4 Sieve Size	Clean Gravels (Little or no Fines)	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
			GP		Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or no Fines
		Gravels With Fines (Appreciable Amount of Fines)	GM		Silty Gravels, Gravel-Sand-Silt Mixtures
			GC		Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS: More Than Half of Coarse Fraction is SMALLER Than No. 4 Sieve Size	Clean Sands (Little or no Fines)	SW		Well-Graded Sands, Gravelly Sands, Little or no Fines
			SP		Poorly-Graded Sands, Gravelly Sands, Little or no Fines
		Sands With Fines (Appreciable Amount of Fines)	SM		Silty Sands, Sand-Silt Mixtures
			SC		Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS: More Than Half of Material is SMALLER Than No. 200 Sieve Size.	SILTS & CLAYS	Liquid Limit Less Than 50	ML		Inorganic Silts & Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticty
			CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
	SILTS & CLAYS	Liquid Limit Greater Than 50	MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils, Elastic Silts
			CH		Inorganic Clays of High Plasticity, Fat Clays
FORMATIONAL MATERIALS	SANDSTONE				Massive Sandstones, Sandstones with Gravel Clasts
	MARLSTONE				Indurated Argillaceous Limestones
	LIMESTONE				Massive or Weakly Bedded Limestones
	CLAYSTONE				Mudstone or Massive Claystones
	SHALLOW MARINE OR CONTINENTAL CLAYS				Tertiary Clay Deposits
	MARINE CLAYS				Cretaceous Clay Deposits
	GROUNDWATER				Indicates Final Observed Groundwater Level Indicates Initial Observed Groundwater Location

APPENDIX

Laboratory and Field Test Procedures

Soil Classification Per ASTM D2487-93
This soil testing standard was used for classifying soils according to the Unified Soil Classification System. The soil classifications of the earth materials encountered are as noted in the attached boring logs.

Soil Water Content Per ASTM D2216-92
This test determines the water content of soil or rock expressed as a percentage of the solid mass of the soil. The test results are listed under **MC** in the attached boring logs.

Soil Liquid Limit Per ASTM D4318-93
The soil Liquid Limit identifies the upper limit soil water content at which the soil changes from a moldable (plastic) physical state to a liquid state. The Liquid Limit water content is expressed as a percentage of the solid mass of the soil. The test results are listed under **LL** in the attached boring logs.

Soil Plastic Limit Per ASTM D4318-93
The soil Plastic Limit identifies a lower limit soil water content at which the soil changes from a moldable (plastic) physical state to a non-moldable (semi-solid) physical state. The Plastic Limit water content is expressed as a percentage of the solid mass of the soil. The test results are listed under **PL** in the attached boring logs.

Plasticity Index Per ASTM D4318-93
This is the numeric difference between the Liquid Limit and Plastic Limit. This index also defines the range of water content over which the soil-water system acts as a moldable (plastic) material. Higher Plasticity Index (PI) values indicate that the soil has a greater ability to change in soil volume or shrink and swell with lower or higher water contents, respectively. The test results are listed under **PI** in the attached boring logs.

Standard Penetration Test (SPT) and Split Spoon Sampler (SS) per ASTM D 1586
This is the standard test method for both the penetration test and split-barrel (spoon) sampling of soils. This sampling method is used for soils or rock too hard for sampling using Shelby Tubes. The method involves penetration of a split spoon sampler into the soil or rock through successive blows of a 140 pound hammer in a prescribed manner.

Blow Counts (N) per ASTM D 1586
This is the number of blows required to drive a Split Spoon Sampler by means of a 140 pound hammer for a distance of 12 inches in accordance with the variables stated in the test procedures.

Shelby Tube (ST) per ASTM D 1587
This procedure is for using a thin-walled metal tube to recover relatively undisturbed soil samples suitable for laboratory tests of physical properties.

Rock Core per ASTM D 2113
This procedure is for using diamond core drilling equipment to obtain core samples of rock and some soils that are too hard to sample by soil-sampling methods.

Dry Density (DD) per ASTM D 2937
This procedure is for the determination of in-place density of soil. The test results are measured in pounds per cubic foot, pcf.

Unconfined Compression Test (UC) per ASTM D 2166
This test method covers the determination of the unconfined compressive strength of cohesive soil in the undisturbed, remolded, or compacted condition, using strain-controlled application of the axial load.

Minus No. 200 Sieve per ASTM D 1140
This test method covers determination of the amount of material finer than a Number 200 sieve by washing. The results are stated as a percent of the total dry weight of the sample.

Pocket Penetrometer (PP): This test method is an accepted modification of ASTM D 1558 test method for establishing the moisture-penetration resistance relationships of fine-grained soils. The test results are measured in tons per square foot, tsf. The strength values provided by this method should be considered qualitatively.

Rock Quality Designation (RQD) : The measure of the quality of a rock mass defined by adding intact rock core pieces greater than four inches in length by the total length of core advance per ASTM 6032.

Recovery Ratio (REC): The Recovery Ratio is equal to the total length of core recovered divided by the total length of core advance.

Boring Logs: This is a summary of the above described information at each boring location.